



IFW16

RAW SEQUENCE LISTING

DATE: 08/11/2004

PATENT APPLICATION: US/10/088,467

TIME: 16:14:14

Input Set : A:\FCCC- US- Tew (ABCA2) Sequence Listing.txt

Output Set: N:\CRF4\08112004\J088467.raw

4 <110> APPLICANT: Tew, Kenneth D.
 5 Vulevic, Bojana
 6 Chen, Zhijian
 8 <120> TITLE OF INVENTION: Nucleic Acid Encoding Human ABCA
 9 Transporter 2 and Methods of Use Thereof
 11 <130> FILE REFERENCE: FCCC.99-08US
 13 <140> CURRENT APPLICATION NUMBER: 10/088,467
 14 <141> CURRENT FILING DATE: 2002-06-24
 16 <150> PRIOR APPLICATION NUMBER: PCT/US00/40789
 17 <151> PRIOR FILING DATE: 2000-08-31
 19 <150> PRIOR APPLICATION NUMBER: 60/154,839
 20 <151> PRIOR FILING DATE: 1999-09-20
 22 <160> NUMBER OF SEQ ID NOS: 36
 24 <170> SOFTWARE: FastSEQ for Windows Version 3.0
 27 <210> SEQ ID NO: 1
 28 <211> LENGTH: 8040
 29 <212> TYPE: DNA
 30 <213> ORGANISM: Homo sapiens
 32 <400> SEQUENCE: 1

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|----|-------------|------------|------------|------------|------------|-------------|------|
| 33 | ccgcggcgct | gaggcgggcg | agcgtggccc | cgccatgggc | ttcctgcacc | agctgcagct | 60 |
| 34 | gctgctctgg | aagaacgtga | cgctcaaagc | cggagcccg | tgggtcctgg | ccttcgagat | 120 |
| 35 | cttcatcccc | ctggtgctgt | tctttatcct | gctggggctg | cgacagaaga | agcccacccat | 180 |
| 36 | ctccgtgaag | gaagtcccc | tctacacagc | ggcgccctcg | acgtctgccc | gcctcctgcc | 240 |
| 37 | tgatcatgca | tcgctgtgcc | cggacggcca | gcgagacgag | ttcggtctcc | tgacgtacgc | 300 |
| 38 | caactccacg | gtcagcgagc | gtcttgagcg | cctggaccgc | gtggtggagg | aaggcaacct | 360 |
| 39 | gtttgaccca | gcgcggccca | gcctgggctc | agagctcgag | gccctacgcc | agcatctgga | 420 |
| 40 | ggccctcagt | gcgggcccgg | gcacctcggg | gagccacctg | gacagatcca | cagtgtcttc | 480 |
| 41 | cttctctctg | gactcggtgg | ccagaaaccc | gcaggagctc | tggcgtttcc | tgacgcaaaa | 540 |
| 42 | cttgctgctg | cccaatagca | cggcccaagc | actcttgccc | gcccgtgtgg | acccgcccga | 600 |
| 43 | ggtctaccac | ctgctctttg | gtccctcatc | tgccctggat | tcacagtctg | gcctccacaa | 660 |
| 44 | gggtcaggag | ccctggagcc | gcctaggggg | caatcccctg | ttccggatgg | aggagctgct | 720 |
| 45 | gctggctcct | gccctcctgg | agcagctcac | ctgcacgccc | ggctcggggg | agctgggccc | 780 |
| 46 | gatcctcact | gtgcctgaga | gtcagaaggg | agccctgcag | ggctaccggg | atgctgtctg | 840 |
| 47 | cagtgggcag | gctgctgcgc | gtgccaggcg | cttctctggg | ctgtctgctg | agctccggaa | 900 |
| 48 | ccagctggac | gtggccaagg | tctcccagca | gctgggcctg | gatgccccca | acggctcgga | 960 |
| 49 | ctcctcgcca | caggcgccac | ccccacggag | gctgcaggcg | cttctggggg | acctgctgga | 1020 |
| 50 | tgcccagaag | gttctgcagg | atgtggatgt | cctgtcgggc | ctggccctgc | tactgccccca | 1080 |
| 51 | gggtgcctgc | actggccgga | cccccgagc | cccagccagt | ggtgcgggtg | gggcggccaa | 1140 |
| 52 | tggcactggg | gcaggggagc | tcatgggccc | caacggccac | gctgaggagg | gcgcaccctc | 1200 |
| 53 | tgctgcagca | ctggccaccc | cggacacgct | gcaggggcag | tgctcagcct | tcgtacagct | 1260 |
| 54 | ctggggccggc | ctgcagccca | tcttgctggg | caacaaccgc | accattgaac | ccgaggcgct | 1320 |
| 55 | gcgggcggggc | aacatgagct | ccctgggctt | cacgagcaag | gagcagcgga | acctgggccc | 1380 |
| 56 | cctcgctgcac | ctcatgacca | gcaaccccaa | aatcctgtac | gcgcctgcgg | gctctgaggt | 1440 |



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| | | | | | | | |
|-----|------------|-------------|------------|-------------|-------------|-------------|------|
| 57 | cgaccgcgtc | atcctcaagg | ccaacgagac | ttttgctttt | gtgggcaacg | tgactcacta | 1500 |
| 58 | tgcccaggtc | tggtcaca | tctcgcgga | gatccgcagc | ttcctggagc | agggcaggct | 1560 |
| 59 | gcagcaacac | ctgcgctggc | tgcagcagta | tgtagcagag | ctgcggctgc | accccagggc | 1620 |
| 60 | actgaacctg | tactggatg | agctgccgcc | ggccctgaga | caggacaact | tctcgctgcc | 1680 |
| 61 | cagtggcatg | gccctctgc | agcagctgga | taccattgac | aacgcggcct | gcggctggat | 1740 |
| 62 | ccagttcatg | tccaagggtga | gcgtggacat | cttcaagggc | ttccccgacg | aggagagcat | 1800 |
| 63 | tgtcaactac | accctcaacc | aggcctacca | ggacaacgtc | actgtttttg | ccagtgtgat | 1860 |
| 64 | cttccagacc | cgaagagacg | gctcgctccc | gcctcacgtg | cactacaaga | tccgccagaa | 1920 |
| 65 | ctccagcttc | accgagaaaa | ccaacgagat | ccgcgcgcgc | tactggcggc | ctgggccc aa | 1980 |
| 66 | tactggcggc | cgcttctact | tcctctacgg | cttcgtctgg | atccaggaca | tgatggagcg | 2040 |
| 67 | cgccatcatc | gacacttttg | tggggcacga | cggtggtggag | ccaggcagct | acgtgcagat | 2100 |
| 68 | gttcccctac | ccctgctaca | cacgcgatga | cttctctgtt | gtcattgagc | acatgatgcc | 2160 |
| 69 | gctgtgcatg | gtgatctcct | gggtctactc | cgtggccatg | accatccagc | acatcgtggc | 2220 |
| 70 | ggagaaggag | caccggctca | aggaggtgat | gaagaccatg | ggcctgaaca | acgcggtgca | 2280 |
| 71 | ctgggtggcc | tggttcatca | ccggctttgt | gcagctgtcc | atctccgtga | cagcactcac | 2340 |
| 72 | cgccatcctg | aagtacggcc | aggtgcttat | gcacagccac | gtgggtcatca | tctggctctt | 2400 |
| 73 | cctggcagtc | tacgcggtgg | ccaccatcat | gttctgcttc | ctgggtgtctg | tgctgtactc | 2460 |
| 74 | caaggccaag | ctggcctcgg | cctgcggtgg | catcatctac | ttcctgagct | acgtgcccta | 2520 |
| 75 | catgtacgtg | gcgatccgag | aggaggtggc | gcataataag | atcacggcct | tcgagaagtg | 2580 |
| 76 | catcgctcc | ctcatgtcca | cgacggcctt | tggtctgggc | tctaagtact | tcgcgctgta | 2640 |
| 77 | tgaggtggcc | ggcgtgggca | tccagtggca | caccttcagc | cagtccccgg | tggaggggga | 2700 |
| 78 | cgacttcaac | ttgctcctgg | ctgtcaccat | gctgatgggtg | gacgcctgtg | tctatggcat | 2760 |
| 79 | cctcacgtgg | tacattgagg | ctgtgcaccc | aggcatgtac | gggctgcccc | ggccctggta | 2820 |
| 80 | cttcccactg | cagaagtcc | actggctggg | cagtgggcgg | acagaagcct | gggagtggag | 2880 |
| 81 | ctggccgtgg | gcacgcaccc | cccgcctcag | tgatcatggag | gaggaccagg | cctgtgccat | 2940 |
| 82 | ggagagccgg | cgctttgagg | agaccctgtg | catggaggag | gagcccaccc | acctgcctct | 3000 |
| 83 | ggttgtctgc | gtggacaaac | tcaccaaggt | ctacaaggac | gacaagaagc | tggccctgaa | 3060 |
| 84 | caagctgagc | ctgaacctct | acgagaacca | ggtggtctcc | ttcttggggc | acaacggggc | 3120 |
| 85 | gggcaagacc | accaccatgt | ccatcctgac | cggcctgttc | cctccaacgt | cgggttccgc | 3180 |
| 86 | caccatctac | gggcacgaca | tccgcacgga | gatggatgag | atccgcaaga | acctgggcat | 3240 |
| 87 | gtgcccctag | cacaatgtgc | tctttgaccg | gctcacgggtg | gaggaacacc | tctggttcta | 3300 |
| 88 | ctcacggctc | aagagcatgg | ctcaggagga | gatccgcaga | gagatggaca | agatgatcga | 3360 |
| 89 | ggacctggag | ctctccaaca | aacggcactc | actggtgcag | acattgtcgg | gtggcatgaa | 3420 |
| 90 | gcgcaagctg | tccgtggcca | tcgccttcgt | gggcggctct | cgcgccatca | tcctggacga | 3480 |
| 91 | gcccacggcg | ggcgtggacc | cctacgcgcg | ccgcgccatc | tgggacctca | tcctgaagta | 3540 |
| 92 | caagccaggc | cgcaccatcc | ttctgtccac | ccaccacatg | gatgaggctg | acctgcttgg | 3600 |
| 93 | ggaccgcatt | gccatcatct | cccattggga | gctcaagtgc | tgcggctccc | cgtcttctct | 3660 |
| 94 | caagggcacc | tatggcgacg | ggtaccgcct | cacgctgggtc | aagcggcccg | ccgagccggg | 3720 |
| 95 | gggcccccaa | gagccagggc | tggcatccag | ccccccagg | cgggccccgc | tgagcagctg | 3780 |
| 96 | ctccgagctc | caggtgtccc | agttcatccg | caagcatgtg | gcctcctgcc | tgctggtctc | 3840 |
| 97 | agacacaagc | acggagctct | cctacatcct | gcccagcgag | gcccgaaga | agggggcttt | 3900 |
| 98 | cgagcgcttc | ttccagcacc | tggagcgag | cctggatgca | ctgcacctca | gcagcttcgg | 3960 |
| 99 | gctgatggac | acgacctgg | aggaagtgtt | cctcaagggtg | tggaggagg | atcagtcgct | 4020 |
| 100 | ggagaacagt | gaggccgatg | tgaaggagtc | caggaaggat | gtgctccctg | gggcggaggg | 4080 |
| 101 | cccggcgtct | ggggagggtc | acgctggcaa | tctggccccg | tgctcggagc | tgaccagtc | 4140 |
| 102 | gcaggcatcg | ctgcagtcgg | cgtcatctgt | gggctctgcc | cgtggcgacg | agggagctgg | 4200 |
| 103 | ctacaccgac | gtctatggcg | actaccgccc | cctctttgat | aaccacagg | accagacaa | 4260 |
| 104 | tgtcagcctg | caagaggtgg | aggcagaggg | cctgtcgagg | gtcgccagg | gcagccgcaa | 4320 |
| 105 | gctggacggc | gggtggctga | aggtgcgcca | gttccacggg | ctgctggtca | aacgcttcca | 4380 |

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|-----|------------|-------------|------------|------------|-------------|-------------|------|
| 106 | ctgcgcccgc | cgcaactcca | aggcactctt | ctcccagatc | ttgctgccag | ccttcttcgt | 4440 |
| 107 | ctgcgtggcc | atgaccgtgg | ccctgtccgt | cccggagatt | ggtgatctgc | ccccgctggt | 4500 |
| 108 | cctgtcacct | tcccagtacc | acaactacac | ccagccccgt | ggcaatttca | tcccctacgc | 4560 |
| 109 | caacgaggag | cgccgcgagt | accggtcgcg | gctatcgccc | gacgccagcc | cccagcagct | 4620 |
| 110 | cgtgagcacg | ttccggctgc | cgtcgggggt | gggtgccacc | tgcgtgctca | agtctcccgc | 4680 |
| 111 | caacggctcg | ctggggccca | cgttgaacct | gagcagcggg | gagtcgcgcc | tgctggcggc | 4740 |
| 112 | tcggtttctt | gacagcatgt | gtctggagtc | cttcacacag | gggctgccac | tgtccaattt | 4800 |
| 113 | cgtgccaccc | ccaccctcgc | ccgccccatc | tgactcgcca | gcgtccccgg | atgaggacct | 4860 |
| 114 | gcaggcctgg | aacgtctccc | tgccgcccac | cgtcgggcca | gaaatgtgga | cgtcggcacc | 4920 |
| 115 | ctccctgccg | cgcctggtac | gggagcccgt | ccgctgcacc | tgctctgcgc | agggcaccgg | 4980 |
| 116 | cttctcctgc | cccagcagtg | tggcggggca | cccgccccag | atgcgggtgg | tcacaggcga | 5040 |
| 117 | cactctgacc | gacatcaccg | gccacaatgt | ctctgagtac | ctgctcttca | cctccgaccg | 5100 |
| 118 | cttcgcactg | caccggatat | gggccatcac | ctttggaaac | gtcctgaagt | ccatcccagc | 5160 |
| 119 | ctcatttggc | accaggggcc | caccatgggt | gcggaagatc | gcgggtgcga | gggctgcccc | 5220 |
| 120 | ggtttttctc | aacaacaagg | gctatcacag | catgcccacc | tacctcaaca | gcctcaacaa | 5280 |
| 121 | cgccatcctg | cgtgcacaacc | tgcccgaagc | caagggcaac | ccggcggttt | acggcatcac | 5340 |
| 122 | cgtcaccaac | caccccatga | ataagaccag | cgccagcctc | tccttggttt | acctgctgca | 5400 |
| 123 | gggcacggat | gtcgtcatcg | ccatcttcat | catcgtggcc | atgtccttcg | tgccggccag | 5460 |
| 124 | cttcgttgtc | ttcctcgtgg | ccgagaagtc | caccaaggcc | aagcatctgc | agtttgctag | 5520 |
| 125 | cggctgcaac | cccatcatct | actggtggc | gaactacgtg | tgggacatgc | tcaactacct | 5580 |
| 126 | ggtccccgct | acctgctgtg | tcattcatct | gtttgtgttc | gacctgccgg | cctacacgtc | 5640 |
| 127 | gcccaccaac | ttccttgccg | tcctctccct | cttctgtctc | tatgggtggg | ccatcacgcc | 5700 |
| 128 | catcatgtac | ccggcctcct | tctggttcga | ggtccccagc | tcgcctacg | tgttcctcat | 5760 |
| 129 | tgtcatcaat | ctcttcatcg | gcattaccgc | caccgtggcc | accttcctgc | tacagctctt | 5820 |
| 130 | cgagcacgac | aaggacctga | aggttgtaaa | cagttacctg | aaaagctgct | tcctcatttt | 5880 |
| 131 | ccccaaacta | aacctggggc | acgggctcat | ggagatggcc | tacaacgagt | acatcaacga | 5940 |
| 132 | gtactacgcc | aagattggcc | agtttgacaa | gatgaagtc | ccgttcgagt | gggacattgt | 6000 |
| 133 | caccgcggga | ctggtggcca | tggcggttga | gggcgtcgtg | ggcttcctcc | tgaccatcat | 6060 |
| 134 | gtgccagtac | aatttctgc | ggcgccaca | gcgcatgcct | gtgtctacca | agcctgtgga | 6120 |
| 135 | ggatgatgtg | gacgtggcca | gtgagcggca | gcgagtgtct | cggggagacg | ccgacaattga | 6180 |
| 136 | catgggtcaa | attgagaacc | tgaccaaggc | ctacaagtcc | cgggaagattg | gccgtatcct | 6240 |
| 137 | ggcgttgac | cgcctgtgcc | tgggtgtgcg | tcctggcgag | tgcttcgggc | tcctgggcgt | 6300 |
| 138 | caacgggtgc | ggcaagacca | gcacctcaa | gatgctgacc | ggcgacgaga | gcacgacggg | 6360 |
| 139 | gggcgaggcc | ttcgtcaatg | gacacagcgt | gctgaaggag | ctgctccagg | tgacgacag | 6420 |
| 140 | cctcggttac | tgcccgcatg | gtgacgcgct | gttcgacgag | ctcacggccc | gggagcacct | 6480 |
| 141 | gcagctgtac | acgcggctgc | gtgggatctc | ctggaaggac | gaggcccggg | tggatgaagt | 6540 |
| 142 | ggctctggag | aagctggagc | tgaccaagta | cgcagacaag | ccggctggca | cctacagcgg | 6600 |
| 143 | cggcaacaag | cgggaagctc | ccacggccat | cgcctcatt | gggtacctag | ccttcattct | 6660 |
| 144 | cctggacgag | cccaccacag | gcattggacc | caaggcccg | cgttcctct | ggaacctcat | 6720 |
| 145 | cctcgacctc | atcaagacag | ggcgttcagt | ggtgctgaca | tcacacagca | tggaggagt | 6780 |
| 146 | cgaggcgtg | tgacgcggc | tggccatcat | ggtgaacgg | cgcctgcgg | gcctgggcag | 6840 |
| 147 | catccagcac | ctgaagaacc | ggtttggaga | tggctacatg | atcacgggtg | ggaccaagag | 6900 |
| 148 | cagccagagt | gtgaaggacg | tgggtgcggt | cttcaaccgc | aacttcccgg | aagccatgct | 6960 |
| 149 | caaggagcgg | caccacacaa | aggtgcagta | ccagctcaag | tcggagcaca | tctcgtggc | 7020 |
| 150 | ccaggtgttc | agcaagatgg | agcaggtgtc | tggcgtgctg | ggcatcgagg | actactcgt | 7080 |
| 151 | cagccagacc | acactggaca | atgtgttcgt | gaactttgcc | aagaagcaga | gtgacaacct | 7140 |
| 152 | ggagcagcag | gagacggagc | cgcctccgc | actcagtc | cctctcggct | gcttgctcag | 7200 |
| 153 | cctgctccgg | ccccggctcg | ccccacggca | gctccgggca | cttggtggcag | acgagcccga | 7260 |
| 154 | ggacctggac | acggaggacg | agggcctcat | cagcttcgag | gaggagcggg | cccagctgtc | 7320 |

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155 cttcaacacg gacacgctct gctgaccacc cagagctggg ccagggagga cacgctccac 7380
156 tgaccaccca gagctgggcc agggactcaa caatggggac agaagtcccc cagtgcctgc 7440
157 cagggcctgg agtggaggtt caggaccaag gggcttctgg tctccagcc cctgtactcg 7500
158 gccatgccct gcggtcactg cggttgccgc ccctaattgt gccaaaggct gacccggccc 7560
159 gggctgcgta cacccttgcc ctgctttgcc ttaaagcctc ggggtctgcc cgccccctcg 7620
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171 <212> TYPE: PRT
172 <213> ORGANISM: Homo sapiens
174 <400> SEQUENCE: 2
175 Met Gly Phe Leu His Gln Leu Gln Leu Leu Leu Trp Lys Asn Val Thr
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177 Leu Lys Arg Arg Ser Pro Trp Val Leu Ala Phe Glu Ile Phe Ile Pro
178 20 25 30
179 Leu Val Leu Phe Phe Ile Leu Leu Gly Leu Arg Gln Lys Lys Pro Thr
180 35 40 45
181 Ile Ser Val Lys Glu Val Pro Phe Tyr Thr Ala Ala Pro Leu Thr Ser
182 50 55 60
183 Ala Gly Ile Leu Pro Val Met Gln Ser Leu Cys Pro Asp Gly Gln Arg
184 65 70 75 80
185 Asp Glu Phe Gly Phe Leu Gln Tyr Ala Asn Ser Thr Val Thr Gln Leu
186 85 90 95
187 Leu Glu Arg Leu Asp Arg Val Val Glu Gly Asn Leu Phe Asp Pro
188 100 105 110
189 Ala Arg Pro Ser Leu Gly Ser Glu Leu Glu Ala Leu Arg Gln His Leu
190 115 120 125
191 Glu Ala Leu Ser Ala Gly Pro Gly Thr Ser Gly Ser His Leu Asp Arg
192 130 135 140
193 Ser Thr Val Ser Ser Phe Ser Leu Asp Ser Val Ala Arg Asn Pro Gln
194 145 150 155 160
195 Glu Leu Trp Arg Phe Leu Thr Gln Asn Leu Ser Leu Pro Asn Ser Thr
196 165 170 175
197 Ala Gln Ala Leu Leu Ala Ala Arg Val Asp Pro Pro Glu Val Tyr His
198 180 185 190
199 Leu Leu Phe Gly Pro Ser Ser Ala Leu Asp Ser Gln Ser Gly Leu His
200 195 200 205
201 Lys Gly Gln Glu Pro Trp Ser Arg Leu Gly Gly Asn Pro Leu Phe Arg
202 210 215 220
203 Met Glu Glu Leu Leu Leu Ala Pro Ala Leu Leu Glu Gln Leu Thr Cys
204 225 230 235 240
205 Thr Pro Gly Ser Gly Glu Leu Gly Arg Ile Leu Thr Val Pro Glu Ser
206 245 250 255

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207 Gln Lys Gly Ala Leu Gln Gly Tyr Arg Asp Ala Val Cys Ser Gly Gln
208                260                265                270
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210                275                280                285
211 Asn Gln Leu Asp Val Ala Lys Val Ser Gln Gln Leu Gly Leu Asp Ala
212                290                295                300
213 Pro Asn Gly Ser Asp Ser Ser Pro Gln Ala Pro Pro Pro Arg Arg Leu
214                305                310                315                320
215 Gln Ala Leu Leu Gly Asp Leu Leu Asp Ala Gln Lys Val Leu Gln Asp
216                325                330                335
217 Val Asp Val Leu Ser Ala Leu Ala Leu Leu Leu Pro Gln Gly Ala Cys
218                340                345                350
219 Thr Gly Arg Thr Pro Gly Pro Pro Ala Ser Gly Ala Gly Gly Ala Ala
220                355                360                365
221 Asn Gly Thr Gly Ala Gly Ala Val Met Gly Pro Asn Ala Thr Ala Glu
222                370                375                380
223 Glu Gly Ala Pro Ser Ala Ala Ala Leu Ala Thr Pro Asp Thr Leu Gln
224                385                390                395                400
225 Gly Gln Cys Ser Ala Phe Val Gln Leu Trp Ala Gly Leu Gln Pro Ile
226                405                410                415
227 Leu Cys Gly Asn Asn Arg Thr Ile Glu Pro Glu Ala Leu Arg Arg Gly
228                420                425                430
229 Asn Met Ser Ser Leu Gly Phe Thr Ser Lys Glu Gln Arg Asn Leu Gly
230                435                440                445
231 Leu Leu Val His Leu Met Thr Ser Asn Pro Lys Ile Leu Tyr Ala Pro
232                450                455                460
233 Ala Gly Ser Glu Val Asp Arg Val Ile Leu Lys Ala Asn Glu Thr Phe
234                465                470                475                480
235 Ala Phe Val Gly Asn Val Thr His Tyr Ala Gln Val Trp Leu Asn Ile
236                485                490                495
237 Ser Ala Glu Ile Arg Ser Phe Leu Glu Gln Gly Arg Leu Gln Gln His
238                500                505                510
239 Leu Arg Trp Leu Gln Gln Tyr Val Ala Glu Leu Arg Leu His Pro Glu
240                515                520                525
241 Ala Leu Asn Leu Ser Leu Asp Glu Leu Pro Pro Ala Leu Arg Gln Asp
242                530                535                540
243 Asn Phe Ser Leu Pro Ser Gly Met Ala Leu Leu Gln Gln Leu Asp Thr
244                545                550                555                560
245 Ile Asp Asn Ala Ala Cys Gly Trp Ile Gln Phe Met Ser Lys Val Ser
246                565                570                575
247 Val Asp Ile Phe Lys Gly Phe Pro Asp Glu Glu Ser Ile Val Asn Tyr
248                580                585                590
249 Thr Leu Asn Gln Ala Tyr Gln Asp Asn Val Thr Val Phe Ala Ser Val
250                595                600                605
251 Ile Phe Gln Thr Arg Lys Asp Gly Ser Leu Pro Pro His Val His Tyr
252                610                615                620
253 Lys Ile Arg Gln Asn Ser Ser Phe Thr Glu Lys Thr Asn Glu Ile Arg
254                625                630                635                640
255 Arg Ala Tyr Trp Arg Pro Gly Pro Asn Thr Gly Gly Arg Phe Tyr Phe

```

RAW SEQUENCE LISTING ERROR SUMMARY

DATE: 08/11/2004

PATENT APPLICATION: US/10/088,467

TIME: 16:14:15

Input Set : A:\FCCC- US- Tew (ABCA2) Sequence Listing.txt

Output Set: N:\CRF4\08112004\J088467.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:20; N Pos. 24,25,29,30,34,35

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/088,467

DATE: 08/11/2004

TIME: 16:14:15

Input Set : A:\FCCC- US- Tew (ABCA2) Sequence Listing.txt

Output Set: N:\CRF4\08112004\J088467.raw

L:698 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:20 after pos.:0